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REPLACES
ART 34 A

CLAIMS

1. Exercise equipment comprising: work load means (9) providing a variable work load; physiological signal measurement means noninvasively measuring a physiological signal during an exercise involving said work load means (9); and load decision means (6) driven by a physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental load, said load decision means (6) changing a work load at said load variation rate.

2. The exercise equipment of claim 1, wherein said physiological signal is one of an electrocardiographical signal and a pulsation signal.

3. The exercise equipment of claim 1, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

4. The exercise equipment of claim 3, wherein said heart rate variability is heart rate variability power.

5. The exercise equipment of claim 3, wherein said heart rate variability is entropy of heart rate variability.

6. The exercise equipment of claim 1, wherein said physiological signal is power spectrum of heart rate variability.

7. The exercise equipment of claim 1, wherein said physiological signal is both of at least one of a heart rate obtained from an electrocardiographical signal and a pulse count obtained from a pulsation signal, and heart rate variability obtained from the electrocardiographical signal.

8. The exercise equipment of claim 7, wherein said heart rate

variability is heart rate variability power.

9. The exercise equipment of claim 7, wherein said heart rate variability is entropy of heart rate variability.

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10. The exercise equipment of claim 1, wherein said physiological signal is both of at least one of a heart rate obtained from an electrocardiographical signal and a pulse count obtained from a pulsation signal, and power spectrum of heart rate variability.

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11. An apparatus estimating a physical fitness level, comprising: physiological signal measurement means (1) noninvasively measuring a physiological signal during an exercise; load decision means (6) driven by said physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental load; and physical fitness level estimation means (6) estimating a physical fitness level from a relationship between a work load and a heart rate during an exercise with said load incremented or decremented at said load variation rate determined.

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12. An apparatus determining an exercise intensity, comprising: physiological signal measurement means noninvasively measuring a physiological signal during an exercise; load decision means (6) driven by a physiological signal obtained during the exercise, to determine a load variation rate of an incremental or decremental load; and exercise intensity decision means (6) determining an optimal exercise intensity from a relationship between a work load and a heart rate variability during an exercise with said load incremented or decremented at said load variation rate determined.

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13. The apparatus of claim 12, wherein said heart rate variability is heart rate variability power.

14. The apparatus of claim 12, wherein said heart rate variability is entropy of heart rate variability.

5 15. An apparatus determining an exercise intensity, comprising:
physiological signal measurement means noninvasively measuring a
physiological signal during an exercise; load decision means (6) driven by a
physiological signal obtained during the exercise, to determine a load
variation rate of an incremental or decremental load; and exercise intensity
10 decision means (6) determining an optimal exercise intensity from a
relationship between a work load and power spectrum of heart rate
variability during an exercise with said load incremented or decremented at
said load variation rate determined.

15 16. Exercise equipment comprising work load means (9) providing
a variable work load and the apparatus of any of claims 11, 12 and 15,
wherein said work load means (9) changes a work load to reflect one of a
physical fitness level obtained from the apparatus estimating a physical
fitness level and an exercise intensity obtained from the apparatus
determining an exercise intensity.

20 17. A method of determining an exercise intensity, noninvasively
measuring a physiological signal during an exercise having a load,
determining a variation pattern of said physiological signal from said
physiological signal for an obtained work load variation with a work load
25 being applied, and determining an appropriate exercise intensity with said
variation pattern determined taken into consideration.

30 18. The method of claim 1, wherein said variation pattern is
determined in a warmup from a predetermined time interval associated
with a work load increasing or from a physiological signal variation rate for
each work load value interval.

19. The method of claim 1, wherein said physiological signal is one

of an electrocardiographical signal and a pulsation signal.

20. The method of claim 17, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

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21. The method of claim 4, wherein said heart rate variability is heart rate variability power.

22. The method of any of claims 17-20, wherein said appropriate exercise intensity corresponding to said variation pattern is determined by a method of an operation corresponding to said variation pattern.

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23. Exercise equipment comprising a load device (9) providing a variable load, physiological signal measuring means (1) measuring a physiological signal invasively over time, and exercise intensity determination means (6) determining from a physiological signal obtained from said physiological signal measuring means (1) for a work load variation a variation pattern of said physiological signal with a work load being applied, and determining an appropriate exercise intensity with said pattern determined taken into account, wherein said load device provides a load set to correspond to said exercise intensity determined by said exercise intensity determination means (6).

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24. Exercise equipment comprising a load device (9) providing a variable load, physiological signal measuring means (1) measuring a physiological signal invasively over time, and physical condition determination means (6) determining from a physiological signal obtained from said physiological signal measuring means (1) for a work load variation a variation pattern of said physiological signal with a work load being applied, and determining a physical condition from said pattern determined.

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25. The exercise equipment of any of claims 23 and 24, wherein said physiological signal is a heart rate variability obtained from an

electrocardiographical signal.

26. An apparatus providing an assistance to determine a physical condition, comprising physiological signal measuring means (1) measuring a physiological signal invasively over time, variation pattern determination means (6) determining from a physiological signal obtained from said physiological signal measuring means (1) for a work load variation a variation pattern of said physiological signal with said work load being applied, and output means (6) outputting said pattern determined.

27. The apparatus of claim 26, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.

28. A measurement apparatus comprising physiological signal measuring means (1) measuring a physiological signal invasively over time, physical condition determination means (6) determining from a physiological signal obtained from said physiological signal measuring means (1) for an obtained work load variation a variation pattern of said physiological signal with a work load being applied, and determining a physical condition from said pattern determined, and output means outputting said physical condition determined.

29. The measurement apparatus of claim 28, wherein said physiological signal is a heart rate variability obtained from an electrocardiographical signal.